

CORRELATION OF INTERMEDIATE ENERGY PROTON- AND NEUTRON-INDUCED FISSION CROSS SECTION IN THE LEAD-BISMUTH REGION

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The recently published data on the intermediate energy proton- and neutron-induced fission cross sections of lead isotopes and neighbouring nuclei measured at The Svedberg Laboratory in Uppsala, Sweden [1] are supplemented with new experimental results. The fission cross sections are divided by the cross sections of the inelastic interaction of protons and neutrons with nuclei parameterized according to Barashenkov [2]. The average fissilities obtained as the result are considered from the point of view of their dependence on nucleon energy (at the energies above 50 MeV, when the shell effects do not play a significant role) and on the fissility parameter Z^2/A . Possible differences between contributions of direct processes (cascade and pre-equilibrium emission) and, therefore, of characteristics of interim compound nuclei for protons and neutrons are estimated with the use of the code TALYS [3]. Since the difference is found to be insignificant (within the frame of the present task), on this general physical base a relation between the intermediate energy proton- and neutron-induced fission cross sections in the region of $A \sim 200$ is derived. The results of the work can be useful for both engineering calculations of neutron production target of ADS and examination of theoretical models.

1. A. N. Smirnov, V. P. Eismont, H. Condé, et al., Journal of Nuclear Science and Technology, Supplement 2. Proc. of Intern Conf. On Nuclear Data in Science and Technology 7-12 Oct, 2001, Tsukuba, Ibaraki, Japan, ed. K. Shibata, Atomic Energy Society of Japan, Japan Atomic Energy Research Institute, vol. 1, p 238-241.
2. V. S. Barashenkov. "Cross sections of interactions of particles and nuclei with nuclei", Moscow, Atomizdat, 1972.
3. A.J. Koning, S. Hilaire, M.C. Duijvestijn, this conference.